

4.13 NOISE

This section describes existing sources of noise within the project vicinity and evaluates whether construction and operational noise generated by the project would exceed applicable noise standards. The section also evaluates potential vibration impacts associated with project construction.

Information presented in this section was obtained from:

- A Noise and Vibration Assessment prepared by Illingworth & Rodkin, Inc. in January 2016
- A Construction Noise Assessment prepared by Wilson Ihrig in June 2018
- *The Contra Costa County General Plan 2005-2020 (General Plan)*

These reports are available for review at the Contra Costa County (County), Department of Conservation and Development, Community Development Division, 30 Muir Road, Martinez, California.

In response to the Notice of Preparation submitted for the project, residents from the surrounding neighborhood expressed concern regarding the potential noise and vibration impacts that would be generated during construction. These concerns are addressed in this section of the draft environmental impact report.

Noise and Vibration Concepts

Noise

Noise can be defined as unwanted sound and is commonly measured with an instrument called a sound level meter. The sound level meter “captures” sound with a microphone and converts it into a number called a sound level. Sound levels are expressed in units called decibels (dB). To correlate this signal to a level that corresponds to the way humans perceive noise, an A-weighting filter is used to deemphasize low-frequency and very high-frequency sound in a manner similar to human hearing. The abbreviation dBA is often used when the A-weighted sound level is reported.

In environmental noise, a change in the noise level of 3 dBA is considered a just noticeable difference. A 5-dBA change is clearly noticeable, but not dramatic. A 10-dBA change is perceived as a halving or doubling in loudness.

Because of the time-varying nature of environmental sound, there are many descriptors that are used to quantify the sound level. Although one individual descriptor alone does not fully describe a particular noise environment, taken together, they can more accurately represent the noise environment. There are four descriptors that are commonly used in environmental studies:

- Maximum instantaneous noise level (L_{max}) is used to identify the loudness of a single event such as a car pass-by or airplane flyover.
- Equivalent noise level (L_{eq}) is used to express the average noise level. The L_{eq} can be measured over any length of time but it is typically reported for periods of 15 minutes to 1 hour.
- Sound level exceeded 90 percent of the time (L_{90}) refers to background noise level (or residual noise level) during the quietest moments. It is usually generated by steady sources such as distant freeway traffic.
- Day/Night Average Sound Level (L_{dn}) is used as an A-weighted sound pressure unit to quantify noise levels over a 24-hour period. L_{dn} is used in place of community noise equivalent level (CNEL), which includes a 5dB penalty to the evening (7 p.m. – 10 p.m.) noise levels. For L_{dn} , these hours are considered daytime hours. Both measurements include a 10dB penalty to nocturnal (10 p.m. – 7 a.m.) noise levels.

Traffic Noise

The source level of traffic noise depends on four primary factors, including the volume of the traffic, speed of the traffic, number of trucks, and the road surface condition. Generally, the loudness of traffic noise is increased by higher traffic volumes, faster speeds, more trucks, and rougher pavement. Noise generally increases 3 dB with each doubling of traffic volume and 6 dB with each doubling of speed. Higher ratios of trucks and rougher pavement do not have as direct of an effect on the noise levels.

Noise Attenuation

Most noise sources can be classified as either point sources (e.g., stationary equipment), or line sources (e.g., a roadway). Sound generated by a point source nominally diminishes (attenuates) at a rate of 6 dBA for each doubling of distance away from the source. For example, a 60 dBA noise level measured at 50 feet from a point source would be 54 dBA at 100 feet from the source and 48 dBA at 200 feet from the source. Noise from a line source normally attenuates at 3 dBA per doubling of distance.

Sound levels can also be attenuated by man-made or natural barriers. Solid walls, berms, or elevation differences typically reduce noise levels by 5 to 10 dBA. Closed windows can reduce interior levels anywhere from 20 to 40 dBA, while buildings with partially open windows can reduce interior noise levels around 15 dBA.

Vibration

Ground vibrations are small oscillatory disturbances to the soil, which are transmitted outwards from their source and reduce in magnitude with increasing distance. The vibration source stimulates the adjacent ground, creating vibration waves that travel through the various soil and rock strata to the foundations of nearby buildings. The vibration then travels from the building foundation throughout the remainder of the building structure. Vibration levels are expressed in inches per second (in/sec) as units called peak particle velocity (PPV), which is defined as the maximum instantaneous peak of the vibration amplitude.

The vibration of floors and walls may cause perceptible vibration, rattling of items such as windows or dishes on shelves, or a rumble noise. The rumble is the noise radiated from the motion of the room surfaces. In essence, the room surfaces act like a giant loudspeaker. This is called groundborne noise.

Groundborne vibration is harder to perceive by people who are outdoors. Although the motion of the ground may be felt, the motion does not provoke the same adverse human reaction without the effects associated with the shaking of a building. In addition, the rumble noise that usually accompanies the building vibration can only occur inside buildings.

4.13.1 EXISTING CONDITIONS

Noise Environment

Some land uses, including schools, hospitals, rest homes, long-term care facilities, mental care facilities, residences, places of worship, libraries, and passive recreation areas depend on low noise levels to ensure the wellbeing of the occupants. The closest sensitive land uses to the project site are the residential communities on the northern, northeastern, eastern, and southeastern borders of the property site.

The noise environment in the project vicinity is primarily the result of distant traffic, construction, and natural noises such as wind and animals. There are few sources of noise in the immediate project vicinity, most notably vehicular traffic along Camille Avenue and nearby ancillary roadways.

Noise Measurements

A noise monitoring survey was performed at the project site from October 23, 2015 to October 28, 2015.¹ This survey included two long-term noise measurements and two short-term measurements (see **Figure 4-13.1**).

¹ Site conditions, land uses, and the noise environment surrounding the project site have not substantially changed since the 2015 noise measurements.

Long-term noise measurement LT-1 was located at the end of Ironwood Place. Hourly average noise levels at this location typically ranged from 40 to 53 dBA L_{eq} during the day and were as low as 34 dBA L_{eq} at night. Occasionally, high maximum instantaneous noise levels, likely due to localized noise sources, raised the average hourly daytime noise levels to between 59 and 63 dBA L_{eq} . The day-night average noise level ranged from 45 to 53 dBA L_{dn} .

Noise measurement LT-2 was taken about 60 feet south of Camille Avenue and 80 feet west of the eastern property line of the site. Hourly average noise levels at this location typically ranged from 40 to 48 dBA L_{eq} during the day and were as low as 37 dBA L_{eq} at night. Occasionally, high maximum noise levels, likely due to localized noise sources, raised the average hourly daytime noise levels to between 54 and 65 dBA L_{eq} . The day-night average noise level ranged from 48 to 56 dBA L_{dn} .

The two short-term measurements were made on October 23, 2015 in concurrent intervals to the long-term measurements. These measurements were attended by a noise technician who documented maximum noise levels at each location. **Table 4.13-1** summarizes short-term noise measurement results.

Table 4.13-1 Summary of Short-Term Noise Measurement Results

Location (Time)	Measured Daytime Noise Levels, dBA					Primary Noise Sources
	L_{eq}	L_1	L_{10}	L_{50}	L_{90}	
ST-1: Path on eastern corner of site, 11:10 a.m. to 11:20 a.m.	40	61	47	41	39	Distant traffic and construction, occasional local traffic, hikers, natural noises
ST-2: Path on southern portion of site, 11:30 a.m. to 11:40 a.m.	44	54	46	42	40	Distant traffic and construction, natural noises

Source: Illingworth & Rodkin, 2016.

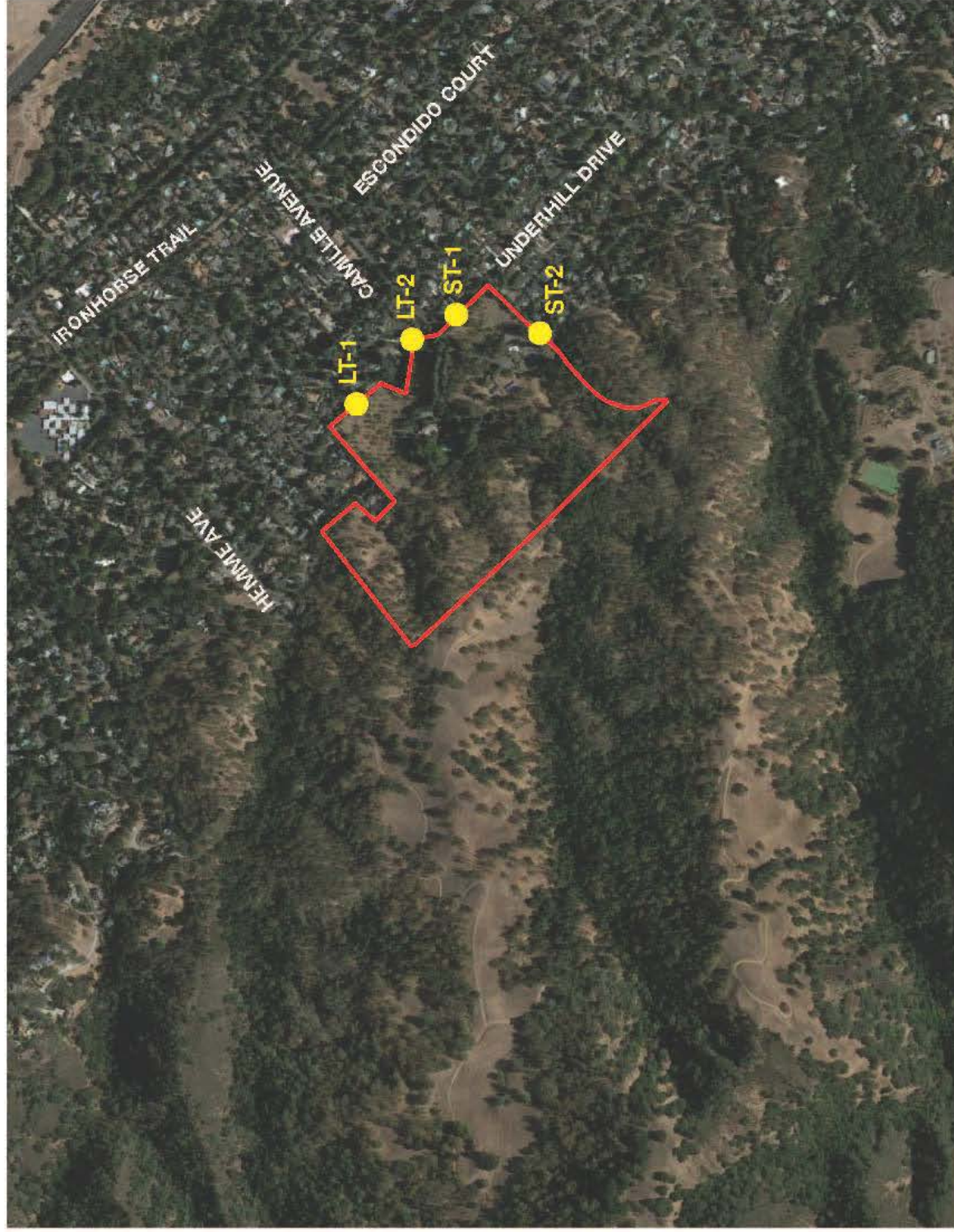


Figure 4.13-1
Noise Measurement Locations

Source: Hingworth and Rodkin, 2016.

4.13.2 REGULATORY SETTING

State

California Code of Regulations

California's Model Community Noise Ordinance (Construction Noise)

The State of California's Model Community Noise Ordinance (Office of Noise Control 1977) contains noise level limits of 75 dBA for mobile construction equipment and 60 dBA for stationary construction equipment at single-family residential areas.

Project Consistency Analysis

Although these standards have not been adopted by the County, the noise study conducted for the project used California's Model Community Noise Ordinance limits to assess the construction noise impacts at residences. The County does not have quantitative noise performance standards for construction activities.

As discussed below in **Subsection 4.13.3**, project construction would cause a temporary increase in noise levels that would have significant noise impacts on the surrounding residential development. Implementation of **Mitigation Measure NOI-1** would impose specific hours for construction and would include other measures to attenuate sound during the construction period such as temporary barriers, truck routing, and location of stationary equipment. Implementation of these measures would ensure consistency with California's Model Noise Ordinance.

Local

Contra Costa County Ordinance Code

Title 7 - Building Regulations, Section 716-8.1004

Pursuant to Title 7 of the Contra Costa County Ordinance Code, grader operations are limited to weekdays between the hours of 7:30 a.m. and 5:30 p.m. This is required for all grading activities located within 500 feet of residential and commercial occupancies. Exceptions are allowed through conditions of approval for a project.

The Contra Costa County General Plan

An objective of the General Plan Noise Element is to provide guidelines to achieve noise/land use compatibility. Relevant policies from this element are listed below.

Noise Element

- 11-1: New projects shall be required to meet acceptable exterior noise level standards as established in the Noise and Land Use Compatibility Guidelines contained in Figure 11-6. These guidelines, along with the future noise levels shown in the future noise contours maps, should be used by the county as a

guide for evaluating the compatibility of “noise sensitive” projects in potentially noisy areas.

- 11-2: The standard for outdoor noise levels in residential areas is a L_{dn} of 60 dB. However, a L_{dn} of 60 dB or less may not be achievable in all residential areas due to economic or aesthetic constraints. One example is small balconies associated with multi-family housing. In this case, second and third story balconies may be difficult to control to the goal. A common outdoor use area that meets the goal can be provided as an alternative.
- 11-4: Title 24, Part 2, of the California Code of Regulations requires that new multiple family housing projects, hotels, and motels exposed to a L_{dn} of 60 dB or greater have a detailed acoustical analysis describing how the project will provide an interior L_{dn} of 45 dB or less. The County also shall require new single-family housing projects to provide for an interior L_{dn} of 45 dB or less.
- 11-6: If an area is currently below the maximum “normally acceptable” noise level, an increase in noise up to the maximum should not be allowed necessarily.
- 11-8: Construction activities should be concentrated during the hours of the day that are not noise-sensitive for adjacent land uses and should be commissioned to occur during normal work hours of the day to provide relative quiet during the more sensitive evening and early morning periods.
- 11-9: Sensitive land uses shall be encouraged to be located away from noise areas, or the impacts of noise on these uses shall be mitigated.
- 11-11: Noise impacts upon the natural environment, including impacts on wildlife, shall be evaluated and considered in review of development projects.

Project Consistency Analysis

The General Plan Noise Element provides guidance for acceptable levels of construction noise. Figure 11-6 of the Noise Element shows that noise levels 60 dBA L_{dn} or lower are Normally Acceptable, while noise levels up to 70 dBA L_{dn} are Conditionally Acceptable.² Accordingly, a noise threshold of 70 dBA L_{dn} has been selected to evaluate the significance of temporary project construction noise on nearby sensitive receptors. Where the noise threshold of 70 dBA L_{dn} is exceeded, proper mitigation is recommended to reduce construction noise below the significance threshold (see **Section 4.13.3**).

² According to the General Plan Noise Element, when a project is anticipated to produce noise levels in the Conditionally Acceptable range, “new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design”. For noise levels in the Normally Acceptable range, the “specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements”.

With regard to operational noise, this analysis uses a 60 dBA L_{dn} noise threshold. An increase in operational noise of 5 dBA L_{dn} or more while maintaining a maximum noise level of 60 dBA L_{dn} or of 3 dBA L_{dn} or more while exceeding 60 dBA L_{dn} would warrant mitigation to reduce operational noise below the significance threshold. Through the application of these construction and operation noise level significance criteria, the project would generally maintain the noise level standards identified in policies 11-1, 11-2, 11-4, and 11-6 of the General Plan Noise Element, presented above.

The project site is located within an existing residential area that does not experience high noise levels. As such, the project would be consistent with policy 11-9. The residential land uses proposed on the project site would not introduce significant increases in noise levels that could impact the natural environment.

4.13.3 IMPACTS AND MITIGATION MEASURES

Significance Criteria

Appendix G of the California Environmental Quality Act (CEQA) Guidelines identifies environmental issues a lead agency can consider when determining whether a project could have significant effects on the environment. The project would have a significant impact if it would:

- For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels.
- For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.
- Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- Expose persons to or generate excessive ground borne vibration or ground borne noise levels.
- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above existing levels existing without the project.

CEQA does not define what noise level increase would be considered substantial. Rather, the standards established in the General Plan Noise Element were used to establish quantitative significance thresholds. According to the Noise Element, residential noise levels up to 60 dBA L_{dn} are considered Normally Acceptable while

noise levels up to 70 dBA L_{dn} are considered Conditionally Acceptable. Accordingly, a significance threshold of 70 dBA L_{dn} was used to evaluate the significance of temporary construction noise on nearby sensitive receptors. Exceedance of the 70 dBA L_{dn} threshold would be considered a significant impact and would require mitigation. Additionally, a significant impact would be identified if the construction of the project would generate groundborne vibration levels at adjacent structures exceeding 0.3 inch per second (in/sec) PPV because these levels would have the potential to result in architectural damage to normal buildings.³

For operational noise, an exterior threshold of 60 dBA L_{dn} was used in residential areas. Project-generated noise level increases of 3 dBA L_{dn} or greater would be considered significant where exterior noise levels would permanently exceed 60 dBA L_{dn} . Where noise levels would remain at or below 60 dBA L_{dn} with the project, noise level increases of 5 dBA L_{dn} or greater would be considered significant. For noise levels inside residences, a threshold of 45 dBA L_{dn} was used.

Discussion of No Impacts

For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, exposure of people residing or working in the project area to excessive noise levels;

and

For a project within the vicinity of a private airstrip, exposure of people residing or working in the project area to excessive noise levels;

The project is located approximately 10 miles southeast of the Buchanan Airport. A review of the Contra Costa County Airport Land Use Compatibility Plan indicates that the project site is not located within the airport sphere of influence. The Little Hands private airstrip, the nearest private airstrip, is located approximately 2 miles south of the project site in the San Ramon area. The airstrip is owned by Little Hands Ranch, which operates three single-engine aircraft on the property. Air traffic in and out of this airport is expected to be minimal as the owner has chosen not to chart the airport, and permission is required from the owner for any aircraft to utilize the airstrip.

Aircraft noise exposure would be considered significant if the project site were exposed to aircraft noise levels exceeding 60 dBA L_{dn} . Noise levels throughout the project site are below 60 dBA L_{dn} and would be considered to be compatible with residential and open space. Therefore, implementation of the project would not

³ Normal buildings defined as those that are not historic and not documented to be structurally weakened.

expose people residing in, or working on, the project area to excessive noise levels, and no impact would occur.

Discussion of Less-than-Significant Impacts

Would the project result in the exposure of persons to or generation of, excessive ground borne vibration or ground borne noise levels?

As stated in **Section 4.13.3**, significant impact would be identified if the construction of the project would generate groundborne vibration levels at adjacent structures exceeding 0.3 inch per second (in/sec) PPV because these levels would have the potential to result in architectural damage to normal buildings. The nearest structures to the project construction areas include existing residences bordering the northern and eastern portions of the site; these structures are located as close as 40 feet to the shared property lines.

Phases of the 30-month construction period may require activities that generate substantial vibration in the immediate vicinity of the work area, such as drilling, the use of jackhammers, rock drills and other high-power or vibratory tools, and rolling stock equipment (tracked vehicles, compactors, etc.). Impact or vibratory pile driving is not anticipated as part of project construction activities. Vibration levels would vary depending on soil conditions, construction methods, and equipment used.

The nearest structures to the project construction areas include existing residences bordering the northern and eastern portions of the site; these residential structures are located as close as 40 feet to the shared property lines. Vibration levels produced by heavy equipment during construction are calculated to be 0.13 in/sec PPV or less at a distance of 40 feet. Vibration levels during heavy construction may occasionally be perceptible at the nearest residences when construction is located directly adjacent to these areas, but would not approach the 0.3 in/sec PPV threshold for architectural damage. Vibration levels would be lower at structures located further from the project site and as construction moves away from the eastern and northern property lines of the site. Given that groundborne vibration would not approach the 0.3 in/sec PPV threshold, this impact would be less than significant.

Discussion of Significant Impacts

Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Impact NOI-1: The project would substantially increase ambient noise levels in the project vicinity above existing levels (Less than Significant with Mitigation).

A substantial permanent noise impact would occur if noise generated by the project would increase noise levels by 5 dBA L_{dn} or greater, if noise levels increased by 3 dBA L_{dn} where exterior noise levels would exceed 60 dBA L_{dn} , or if the existing noise levels are below 60 dBA but would be increased to above this threshold.

Existing traffic noise levels at residences in the vicinity of the project are currently below 60 dBA L_{dn} . Existing noise measurements averaged between 45 to 56 dBA L_{dn} . Projected traffic volumes associated with project operation were prepared for the project by Abrams Associates Traffic Engineering, Inc. for five intersections in the project vicinity (see **Appendix P**). The anticipated traffic volumes associated with the project were evaluated against the existing traffic volumes to calculate the relative increase in traffic noise attributable to the project. According to the traffic report, the project, as proposed, would generate approximately 32 AM peak hour trips, and 43 PM peak hour trips (see **Section 4.16, Transportation and Traffic**). Traffic noise levels are anticipated to increase by less than 1 dBA at all study intersections as a result of the project.

The project would include new stationary noise sources such as landscape maintenance activities, ventilation systems, and other noise-generating sources related to single-family residential development. These activities are generally intermittent and are consistent with other noise events occurring in the community. For example, typical noise levels from a gas lawn mower averages up to 70 dBA L_{max} at a distance of 100 feet, whereas typical new residential mechanical ventilation systems (such as exterior air conditioning units) generate noise levels from 50 dBA to 65 dBA L_{eq} at 10 feet.

Individual residences constructed on the property could potentially include outdoor air-conditioning equipment and pool pumps, which would represent more consistent noise sources. Typically, single family residential use air conditioning equipment would be anticipated to generate noise levels of 50 to 65 dBA L_{eq} at a distance of 10 feet from the equipment. Noise levels would drop off as distance increases between the source and receptor. Equipment located inside the residence or in a fully enclosed room with a roof would not be anticipated to be audible at off-site locations (Illingworth & Rodkin, 2018).

The project would be subject to all noise-related regulations, plans, and policies established within documents prepared by the State of California and Contra Costa

County. However, Contra Costa County does not have a noise ordinance, nor does the County's General Plan provide any quantifiable noise limits directly applicable to mechanical equipment noise (see **Section 4.13.2, Regulatory Setting**). Based on the Land Use Compatibility thresholds identified in the General Plan Noise Element, the Normally Acceptable threshold for outdoor noise levels in residential areas is a L_{dn} of 60 dBA. However, ambient noise levels at adjacent existing residences are generally below 55 dBA L_{dn} .

Existing residences surround the site to the north, east, and west. Based on review of aerial images, most of these existing residences include air conditioning units and backyard pools, with lot sizes similar to those proposed with the project. Residential property lines could be located within 50 feet of proposed mechanical equipment and/or pumps. Noise generated by project mechanical equipment would be similar could exceed applicable thresholds for residential areas. This represents a potentially significant impact, which would be reduced to a less-than-significant level with implementation of **Mitigation Measure NOI-1**.

Mitigation Measure NOI-1: Prior to the issuance of building permits, any outdoor mechanical equipment, air conditioning units, or pumps shall be selected and designed to reduce impacts on surrounding uses. A qualified acoustical consultant shall be retained by the project applicant to review mechanical noise as the equipment systems are selected in order to determine specific noise reduction measures necessary to reduce noise to 55 dBA L_{dn} at the shared property line. Noise reduction measures could include, but are not limited to, locating equipment in shielded and/or less noise-sensitive areas, selection of equipment that emits low noise levels, and/or installation of noise barriers such as enclosures to block the line of sight between the noise source and the nearest receptors. Other feasible controls could include, but shall not be limited to, fan silencers, enclosures, and mechanical equipment screen walls.

Significance after Mitigation: With implementation of **Mitigation Measure NOI-1**, operational noise sources would not exceed applicable noise thresholds. This impact would be less than significant

Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above existing levels existing without the project?

For the purposes of this analysis, construction of the project (from demolition to construction of future residences) is conservatively anticipated to occur over a 30-month period.⁴ Under this assumption, the project has the potential to expose sensitive receptors to a substantial temporary increase in ambient noise levels.

⁴ In reality, project construction could last up to 10 years, but this 30-month assumption provides a conservative approach because it would expose receptors to a more constant increase in noise levels for a continuous duration.

Impact NOI-2: Existing noise-sensitive land uses would be exposed to construction noise levels in excess of 70 dBA L_{dn} during construction (Less than Significant with Mitigation).

Construction would entail two main phases: project site preparation and home construction. Project site preparation would include demolition, construction of a keyway at the toe of the slopes along the western residential lots, grading and compaction, utility installation, construction of the curbs and gutters, and road paving. Home construction can be divided into exterior work (such as construction of the foundations or erection of the building envelope) and interior work. Noise generated by interior work would be substantially attenuated by the natural acoustical shielding provided by the building envelope.

The loudest construction phase would be the construction of a keyway and would reach a maximum of 78 dBA L_{dn} at residences located 35 to 53 feet from the perimeter of the project site and would last for 6 days. Impacts from keyway construction would be less severe at residences located farther away from the site perimeter. The longest construction phases would be the construction of the exterior and interior of the new buildings (395 days and 402 days, respectively). Of the two phases, noise levels during exterior construction would be louder, reach a maximum of 72 dBA L_{dn} at a distance of 68 feet. These levels can be considered worst-case, as they do not take into account additional shielding that is normally provided by typical residential fencing, shrubbery, and sound absorption by porous soil. Furthermore, these levels assume that equipment would be stationary at the property line and operating at or close to full speed for the duration of the work. In reality, construction equipment is expected to continuously move around the work area and be shielded at times by other equipment, so actual dBA L_{dn} levels would be slightly lower depending on the degree of temporary shielding (Wilson Ihrig, 2018).

In addition to general construction activities, the transport of workers, equipment, and materials to the project site would introduce noise on access roads leading to the site. However, the noise generated by construction related-traffic would be minimal and lower than the noise levels expected during demolition and construction activities.

Construction noise levels predicted to occur from off-road construction equipment would exceed the 70 dBA L_{dn} threshold at residences adjacent to the project site. In order to reduce noise impacts associated with all construction activities, **Mitigation Measures NOI-2** and **NOI-3** would be implemented.

Mitigation Measure NOI-2: Abatement of excessive noise from off-road construction equipment would be accomplished by means of temporary acoustical screens of suitable height and extent. Such screens would completely interrupt the line-of-sight between the equipment and receptors of the noise and would have no gaps or openings. Efficacy would be maximized by placing screens as close to noise sources as possible. Sound screens will be

approximately 12 feet in height and will provide approximately 8 decibels reduction in noise levels at the first and second stories of nearby homes.⁵ When construction noise impacts reach a level below 70 dBA L_{dn} /CNEL at the nearest homes, the temporary screens can be removed.

Construction is likely to be concentrated in one or a few contiguous areas at a time during each phase. Therefore, sound screens need not extend along the entire site perimeter at once, but could be shorter and moved following the work so as to provide shielding to one or more sensitive receptors near the work area. However, in order to maintain the full acoustic benefit, these screens will extend at least 1.5 times their height past each side of the area where construction equipment is to operate. This will minimize sound escaping around the ends of the screens.

Mitigation Measure NOI-3: The applicant shall develop a construction mitigation plan with input from County staff to minimize construction noise disturbance. Considering the potential for substantial increases in noise at adjacent residences as a result of project construction, the following conditions shall be incorporated into contract agreements to reduce construction noise impacts:

- Restrict noise-generating activities including construction traffic at the construction site or in areas adjacent to the construction site to the hours of 8:00 a.m. to 5:30 p.m., Monday through Friday, with no construction allowed on Federal and State weekends and holidays.
- Potential contractors shall be requested to submit information on their noise management procedures and demonstrate a successful track record of construction noise management on prior projects.
- The selected contractor will equip all internal combustion engine driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.
- The selected contractor will prohibit unnecessary idling of internal combustion engines.
- The selected contractor will locate stationary noise generating equipment such as air compressors or portable power generators as far as practical from sensitive receptors.
- The selected contractor will utilize “quiet” air compressors and other stationary noise sources where technology exists.
- The selected contractor shall limit the allowable hours for the delivery of materials or equipment to the site and truck traffic coming to and

⁵ Refer to the Construction Noise Assessment (Wilson Ihrig, 2018) for more information regarding noise screens.

from the site for any purpose to Monday through Friday between 8:00 a.m. and 5:30 p.m.

- The selected contractor will establish construction staging areas and material stockpiles at locations that will create the greatest distance between the construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction as is feasible.
- During tree demolition, the woodchipper shall be located on Lot 30 to reduce the effect of noise levels to sensitive receptors. If the chipper is to be moved into other areas of the site, a qualified registered professional Noise Consultant shall determine the allowable distance from sensitive receptors so as to ensure consistency with the County's noise thresholds. A noise contour map will be provided defining the boundaries of the chipper access on the project.
- The selected contractor will route all construction traffic to and from the project site via designated truck routes where possible and prohibit construction related heavy truck traffic in residential areas where feasible.
- The selected contractor will control noise from construction workers' radios to a point where they are not audible at existing residences bordering the project site.
- After grading is complete and during construction of site improvements, the contractor will limit use of the property a distance of 75 feet from adjacent neighbor's properties. Stockpiles and equipment storage shall be predominately on interior lots.
- The selected contractor will notify neighbors located adjacent to the construction site of the construction schedule in writing.
- The selected contractor will designate a project liaison that will be responsible for responding to noise complaints during the construction phase. The name and phone number of the liaison will be conspicuously posted at construction areas and on all advanced notifications. This person will take steps to resolve complaints, including periodic noise monitoring, if necessary. Results of noise monitoring will be presented at regular project meetings with the project contractor, and the liaison will coordinate with the contractor to modify any construction activities that generated excessive noise levels to the extent feasible.
- The selected contractor will hold a preconstruction meeting with the job inspectors and the general contractor/on-site project manager to confirm that noise mitigation and practices (including construction hours, construction schedule, and noise coordinator) are completed.

- Neighboring property owners within 300 feet of construction activity shall be notified in writing of the construction schedule and at least 30 days prior to loud noise-generating activities. Notification will include the nature and estimated duration of the activity.
- A qualified acoustical professional shall be retained as needed to address neighbor complaints as they occur. If complaints occur, noise measurements could be conducted to determine if construction noise levels at adjacent property lines are within acceptable performance standards. Short-term construction noise monitoring could also be utilized to diagnose complaints and determine if additional reductionary measures are required for certain phases of construction.

Further, temporary increases in noise levels during construction could affect nesting birds and other sensitive wildlife, which is inconsistent with policy 11-11. Impacts to the natural environment, including wildlife, are discussed in **Section 4.4, Biological Resources**. Implementation of pre-construction surveys, as identified in **Mitigation Measures BIO-1** through **BIO-5**, would reduce potential noise impacts to the natural environment to a less-than-significant level, consistent with policy 11-11.

Significance after Mitigation: Implementation of **Mitigation Measure NOI-2**, **Mitigation Measure NOI-3**, and **Mitigation Measures BIO-1** through **BIO-5** would reduce on-site construction noise levels. With implementation of these mitigation measures, temporary noise impacts resulting from project construction would be less than significant.

Would the project expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Impact NOI-3: The project would generate noise levels in excess of standards established in the General Plan Noise Element (Less than Significant with Mitigation)

Pursuant to the General Plan Noise Element, a significant noise and land use compatibility impact would occur if exterior noise levels in the surrounding single-family residential areas exceeded 60 dBA L_{dn} , if interior noise levels inside potential homes exceeded 45 dBA L_{dn} .

As discussed above, existing ambient noise levels at the easternmost portion of the site range from 45 to 56 dBA L_{dn} . The western portion of the site is located further from area noise sources (traffic and residential noise) and would be exposed to lower noise levels. As discussed in **Impact NOI-1**, project-related traffic would increase noise levels by approximately 1 dBA and therefore would not expose sensitive receptors to noise levels in excess of applicable standards.

The operation of outdoor air-conditioning equipment and pool pumps could generate noise between 50 to 65 dBA L_{eq} at a distance of 10 feet, which could exceed the exterior noise significance threshold at nearby residences. As discussed in **Impact NOI-1**, the implementation of **Mitigation Measure NOI-1** would ensure that operational noise sources would not increase average noise levels by or to unacceptable levels.

With respect to interior noise levels, a typical residential structure would provide about 15 dBA of noise reduction from exterior noise sources with windows open and 20 to 25 dBA of noise reduction with windows closed. Because project operation would not cause any exterior noise levels to exceed 57 dBA L_{dn} , future residences built on the project site would meet the County's interior noise level standard of 45 dBA L_{dn} .

Pursuant to the General Plan Noise Element, a significant construction noise impact would occur if exterior noise levels in the single-family residential areas around the project site exceed 70 dBA L_{dn} . As discussed in **Impact NOI-2**, implementation of **Mitigation Measures NOI-2** and **NOI-3** would reduce construction noise to less-than-significant levels. In addition to this quantitative threshold, the General Plan Noise Element indicates that (1) construction activities should be concentrated during the hours of the day that are not noise-sensitive for adjacent land uses, and (2) should occur during normal work hours of the day to provide relative quiet during the more sensitive evening and early morning periods. As addressed in **Mitigation Measure NOI-3**, construction will be limited to the hours of 8:00 a.m. and 5:30 p.m., Monday through Friday, with no construction allowed on weekends or holidays. Therefore, the project would not exceed applicable noise standards.

Implementation of **Mitigation Measure NOI-2** and **NOI-3** would ensure compliance with applicable noise standards established in the General Plan Noise Element. Therefore, this impact would be less than significant.

4.13.4 CUMULATIVE IMPACTS

The cumulative setting for noise impacts is specifically the project and the three proposed developments within a 1-mile radius of the project site (see **Chapter 4.0, Setting, Impacts, and Mitigation Measures**). The closest cumulative project is located at 513 Hemme Avenue, approximately 1,000 feet northwest of the project site. Cumulative construction and operational noise could affect sensitive receptors located between 513 Hemme Avenue and the Ball Estates project. However, both projects would implement construction noise management practices to reduce substantial construction noise, and neither project would contribute considerable amounts of operational noises. Other projects on the cumulative project list are located too far from the project site to result in cumulative noise impacts. Given this, cumulative noise impacts would be less than significant.

4.13.5 REFERENCES

Abrams Associates Traffic Engineering Inc., 2015. *Transportation Impact Study, Ball Property*. Prepared for Aliquot Associates, July 7, 2015.

Illingworth and Rodkin Inc., 2016. Ball Estates Project Noise and Vibration Assessment.

Wilson Ihrig, 2018. *Construction Noise Assessment, Ball Estates Single-Family Development*. Prepared for Aliquot Associates, June 7, 2018.